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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Lea Di Cioccio

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Nixon Peabody LLP
P.O. Box 60610
Palo Alto, CA 94306

EXAMINER

STARK, JARRETT J

ART UNIT

PAPER NUMBER

2823

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/526,657	Applicant(s) DI CIOCCIO ET AL.	
	Examiner JARRETT J. STARK	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Response to Arguments***

Applicant's arguments filed 8/24/210 have been fully considered but they are not persuasive.

Applicants argue Letertre et al. does not use SiO₂ as the preferred bonding layer, but however proposes the use of WSi₂ instead for the low cost structure for which further high quality SiC is epitaxially grown upon.

This argument is respectfully traversed because, although not taught as a preferred embodiment, Letertre et al. teaches this embodiment nonetheless, and disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). Even a teaching away from a claimed invention does not render the invention patentable. See Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998), where the court held that the prior art anticipated the claims even though it taught away from the claimed invention.

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“The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed.” To further clarify, a prior art opinion that a claimed invention is not preferred for a particular limited purpose, does not preclude utility of the invention for that or another purpose, or even preferability of the invention.

Specifically, it can be directly inferred from the teachings of Leterte et al. that a understood intended use of the prior art bonded structure analogous to the intended used of the proposed modified bonded structure using WSi₂ instead of a oxide. The background section of Leterte et al. merely teaches that the SiCOI substrate, which later has a SiC layer grown from the transferred thin SiC film, conventionally incorporates an oxide layer for bonding. The purpose of the NPL experiment/result section is to show that WSi₂ is a acceptable replacement for the conventionally used SiO₂.

For additional support, of the asserted inferred understanding of the NPL document see Soref et al. (US Pat. 5,880,491) which explicitly demonstrates the NPLs inferred prior art of epitaxially growing the SiC epitaxy layer on a SiCOI substrate that incorporates the prior art “oxide” material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Letertre et al., “QuaSIC Smart-Cut Substrates for SiC High Power Devices” (Letertre).

Regarding claims 7 and 11, Letertre discloses on pages 151-154, a SiCOI type composite substrate manufacturing method comprising the following steps:

- supply of an initial substrate comprising an SiC support bearing an intermediate layer whereon a thin layer of SiC is transferred,
 - epitaxy of SiC on the thin layer of SiC,
- wherein the epitaxy is conducted at the following temperature:
1450°C to obtain 4H polytype epitaxy on a transferred thin 4H polytype layer.

Letertre is silent upon disclosing silicon oxide as the intermediate bonding layer. Letertre discloses with the preferred embodiment that the intermediate bonding layer comprises tungsten silicide. Letertre does however disclose in paragraph 2 on page 151 that oxide layers are capable of being selected for the purpose of being selected for an intermediate bonding layer between a SiC

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substrate and a thin SiC being transferred (i.e. producing SiCOI substrates (SiC on insulator)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select silicon oxide, since it has been held to be within the general skill of a worker in the art to select a known material on the base of its suitability, for its intended use involves only ordinary skill in the art. *In re Leshin*, 125 USPQ 416.

Regarding claim 10, Letertre discloses in the 2nd paragraph of page 152, wherein several [4h] SiC layers are successively grown epitaxially on the thin [4h] SiC layer.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Letertre in view of Vinod et al., “Fabrication of Low Defect Density 3C-SiC on SiO₂ Structures Using Wafer Bonding Techniques” (Vinod).

Regarding claims 8 and 9, Letertre discloses the method above but does not specifically disclose wherein before the epitaxy step, an initial substrate preparation step is provided.

Vinod discloses in the 2nd and 4th paragraph of L18 wherein before the epitaxy step, an initial substrate preparation step is provided that consists of

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subjecting the surface of the transferred thin SiC layer to an operation selected from polishing etching and hydrogen etching.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the preparation process of Vinod in the method of Letertre for the purpose of smoothing the surface or removing contaminants from the surface.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARRETT J. STARK whose telephone number is (571)272-6005. The examiner can normally be reached on Monday - Thursday 7:00AM - 5:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jarrett J Stark/
Primary Examiner, Art Unit 2823

9/10/2010
/J. J. S./
Primary Examiner, Art Unit 2823